## REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated December 15, 2003. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1-7 are under consideration in this application. Claims 1, 4 and 6 are being amended, as set forth in the above marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention.

Additional Amendments

The claims are being amended to correct formal errors and/or to better recite or describe the features of the present invention as claimed. All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

Claims 1 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,433,764 to Hebiguchi et al. (hereinafter "Hebiguchi"), in view of U.S. Pat. No. 5,062,690 to Whetten (hereinafter "Whetten"), and claims 2-3 and 5-7 were rejected as being unpatentable over Hebiguchi and Whetten and further in view of U.S. Pat. No. 6,456,013 to Komiya et al. (hereinafter "Komiya"). These rejections have been carefully considered, but are most respectfully traversed.

The liquid crystal display device of the invention (e.g., Fig. 4), as now recited in independent claim 1, comprises: a liquid crystal LC; and two substrates SUB1, SUB2 opposed to each other with the liquid crystal LC interposed in between, the liquid crystal display device further comprising on a liquid-crystal-side surface of one of the two substrates: a plurality of gate signal lines GL; a plurality of drain signal lines DL that cross the plurality of gate signal lines GL;

pixel regions each enclosed by two gate signal lines GL adjacent to each other and two drain signal lines DL adjacent to each other; a switching element that is provided in each pixel region and driven by a scanning signal supplied from one of the two gate signal lines GL that define the pixel region; a pixel electrode PIX that is provided in each pixel region and supplied, via the associated switching element, with a video signal from one of the two drain signal lines DL that define the pixel region; an insulating film GI; and **a repair conductive layer** RST formed so as to be contained in each of the plurality of drain signal lines DL when viewed perpendicularly and **to be insulated from said each of the plurality of drain signal lines DL with the insulating film GI interposed in between** (Fig. 4; paragraphs [0032],[0034]).

The present invention, as now recited in claim 4, is also directed to a liquid crystal display device comprising: a liquid crystal; and two substrates opposed to each other with the liquid crystal interposed in between, the liquid crystal display device further comprising on a liquid-crystal-side surface of one of the two substrates: an insulating film; a plurality of gate signal lines formed at a position closer to the one substrate than the insulating film is; a plurality of drain signal lines that cross the plurality of gate signal lines and are formed at a position closer to the liquid crystal than the insulating film is; pixel regions each enclosed by two gate signal lines adjacent to each other and two drain signal lines adjacent to each other; a thin-film transistor that is provided in each pixel region and driven by a scanning signal supplied from one of the two gate signal lines that define the pixel region; a pixel electrode that is provided in each pixel region and supplied, via the associated thin-film transistor, with a video signal from one of the two drain signal lines that define the pixel region; and **a repair conductive layer** formed at a position closer to the one substrate than the insulating film is so as to be contained in each of the plurality of drain signal lines when viewed perpendicularly and **to be insulated from said each of the plurality of drain signal lines with the insulating film interposed in between**.

The present invention, as now recited in claim 6, is also directed to a liquid crystal display device comprising: a liquid crystal; and two substrates opposed to each other with the liquid crystal interposed in between, the liquid crystal display device further comprising on a liquid-crystal-side surface of one of the two substrates: an insulating film; a plurality of gate signal lines formed at a position closer to the one substrate than the insulating film is; a plurality of drain signal lines that cross the plurality of gate signal lines and are formed at a position closer to the liquid crystal than the insulating film is; pixel regions each enclosed by two gate signal lines adjacent to each other and two drain signal lines adjacent to each other; a thin-film transistor

that is provided in each pixel region and driven by a scanning signal supplied from one of the two gate signal lines that define the pixel region; a pixel electrode that is provided in each pixel region and supplied, via the associated thin-film transistor, with a video signal from one of the two drain signal lines that define the pixel region; and **a repair conductive layer** formed at a position closer to the one substrate than the insulating film so as to be contained in each of the plurality of drain signal lines when viewed perpendicularly and **to be insulated from said each of the plurality of drain signal lines with the insulating film interposed in between**, at least one of the plurality of drain signal lines having a disconnected portion and melt-formed portions that are located on both sides of the disconnected portion and penetrate the insulating film.

The repair conductive layer RST is insulated from a respective drain signal line DL with the insulating film GI interposed in between. Only when a disconnection occurs in a drain signal line, laser light is then applied to two locations of the disconnected drain signal line on both sides of the disconnected portion to re-connect the parts of the drain signal line on both side of the disconnected portion via the repair conductive film. This is done by only two applications of laser light (Fig. 6; paragraphs [0014], [0060], [0061]). Since each repair conductive layer is formed so as to be contained in the associated drain signal line when viewed perpendicularly, it does not prevent increase of the pixel aperture ratio (paragraphs [0015], [0062]).

Applicants respectfully contend that none of the cited prior art references teaches or suggests such "a repair conductive layer RST formed so as to be contained in each of the plurality of drain signal lines DL when viewed perpendicularly and to be insulated from said each of the plurality of drain signal lines DL with the insulating film GI interposed in between" according to the invention.

Admitted by the Examiner, Hebiguchi does not disclose any repair conductive layer formed so as to be contained in each of the plurality of drain signal lines DL when viewed perpendicularly.

Whetten was relied upon by the Examiner to teach "a repair conductive layer formed so as to be contained in each of the plurality of drain signal lines when viewed perpendicularly with the insulating film interposed in between." Whetten, however, fails to teach "a repair conductive layer RST formed so as to be insulated from said each of the plurality of drain signal lines DL with the insulating film GI interposed in between." In contrast, Whetten's insulation layer 40' (insulation portion 80) only *partially* provided between the lower level data line metal (redundant

data line) 18"a, 18"b and the upper level data line metal 18'a, 18'b (col. 8, lines 48-51), and the lower level data line metal (redundant data line) 18"a, 18"b are designed to always electrically ***contact with*** (rather than "***insulate from***") and an upper level data line metal 18'a, 18'b ("*insulation portions 80 and 82 should be narrower than the lower level scan and data line metallization [18"a, 18"b] so that the upper level scan and data line metallization [18'a, 18'b] can contact the lower level metal on either side of portions 80 and 82*" col. 8, line 66 – col. 9, line 2; Figs. 7A-7C). As such, Whetten's teaching of the redundant data line 18"a, 18"b, actually teaches away from the invention.

Komiya fails to compensate for the above-mentioned deficiencies since Komiya only discloses a laser crystallization technology from a-Si to poly-Si. Komiya is not related to drain signal line repairing technology.

As to the references concurrently submitted via of IDS, Park (KR2000-56613 and USP 6,429,907) discloses a redundancy layer 15 or 35 formed under a data line 17 or 37 (Figs. 2 & 4). However, Park does not disclose any insulation layer provided between the data line 17, 37 and the redundancy layer 15 or 35. The redundancy layer 15 or 35 always electrically contact with (rather than "insulate from") and the data line 17 or 37. Park is not related to signal line repairing technology by laser.

Samsung (KR2000-20855) discloses that a redundancy data line 80 provided on a data line 60 (Figs. 3 & 4). The redundancy data line 80 consists of a lower layer 801 made of ITO and an upper layer 802 made of Mo, Mo alloy, Al or Al alloy, etc. However, Samsung does not disclose any insulation layer provided between the data line 60 and the redundancy data line 80. The redundancy data line 80 always electrically contact with (rather than "insulate from") and the data line 60. Samsung is not related to is not related to signal line repairing technology by laser.

Applicants contend that neither Hebiguchi, Whetten, nor their combination teaches or discloses each and every feature of the present invention as disclosed in independent claims 1, 4 and 6. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the

the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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